

CLAIMS

What is claimed is:

1. A pick and place apparatus comprising:

a cam apparatus including:

an input shaft rotatably supported on a housing and continuously driven to rotate at a constant speed,

a first output shaft rotatably supported on said housing and to which rotational motion at an inconstant speed of a specific pattern resulting from the conversion of continuous rotational motion at a constant speed of said input shaft is transmitted through a rotational motion converting cam mechanism,

a slider member provided coaxially to said first output shaft and capable of relative displacement along the axial direction through a relative rotation regulating cam mechanism while its relative rotation with said first output shaft is regulated, and to which a reciprocal rectilinear motion in the axial direction of the first output shaft resulting from the conversion of the continuous rotational motion at a constant speed of said -input shaft is transmitted through a cam link mechanism,

a second output shaft provided coaxially to said first output shaft and rotatably while its movement in said axial direction is regulated,

a motion converting cam mechanism interposed between said second output shaft and said slider member, which converts the reciprocal rectilinear motion displacement of said slider member into the oscillating rotational motion displacement of said second output shaft to transmit the same thereto, and

transmits the rotational motion at an inconstant speed of said slider member to said second output shaft,

in which the oscillating rotational motion of said slider member and the rotational motion at an inconstant speed of a specific pattern of said first output shaft are compounded and are transmitted to said second output shaft;

an arm member fixed on said first output shaft which is telescopic in the radial direction of the first output shaft; and

a telescopic driving means that converts the relative rotation generated between said first output shaft and said second output shaft into an expansion or contraction motion of said arm member and transmits as such;

wherein the rotational motion at an inconstant speed of said specific pattern of said first output shaft is an intermittent indexing rotational motion, the reciprocal rectilinear motion of said slider member is made while said intermittent indexing rotational motion is stationary, and during the stationary period said arm member expands or contracts at the indexing position.

2. A pick and place apparatus comprising:

a cam apparatus including:

an input shaft rotatably supported on a housing and continuously driven to rotate at a constant speed,

a first output shaft rotatably supported on said housing and to which rotational motion at an inconstant speed of a specific pattern resulting from the conversion of continuous rotational motion at a constant speed of said input shaft is transmitted through a rotational motion converting cam mechanism,

a slider member provided coaxially to said first output shaft and capable of relative displacement along the axial direction through a relative rotation regulating cam mechanism while its relative rotation with said first output shaft is regulated, and to which a reciprocal rectilinear motion in the axial direction of the first output shaft resulting from the conversion of the continuous rotational motion at a constant speed of said input shaft is transmitted,

a second output shaft provided coaxially to said first output shaft and rotatably while its movement in said axial direction is regulated,

a motion converting cam mechanism interposed between said second output shaft and said slider member, which transforms the reciprocal rectilinear motion displacement of said slider member into the oscillating rotational motion displacement of said second output shaft to transmit the same thereto, and transmits the rotational motion at an inconstant speed of said slider member to said second output shaft,

in which the oscillating rotational motion of said slider member and the rotational motion at an inconstant speed of a specific pattern of said first output shaft are compounded and are transmitted to said second output shaft;

a snatching means comprising a pair of snatching arms of which an end is pivotally supported on a base member fixed on said first output shaft;

a snatch arm driving means that converts relative rotations generated between said first output shaft and said second output shaft into

the unfolding and folding motion of said snatching means and transmits the same;

wherein the rotational motion at an inconstant speed of said specific pattern of said first output shaft is an intermittent indexing rotational motion, the reciprocal rectilinear motion of said slider member is made while said intermittent indexing rotational motion is stationary, and during the stationary period said snatching means unfolds and folds at the indexing position.